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A MEDICAL-SOCIAL FOLLOW-UP STUDY OF TWENTY-THREE PATIENTS WITH IDIOPATHIC SCOLIOSIS UNDER TREATMENT AT MASSACHUSETTS GENERAL HOSPITAL

A THESIS

Submitted by

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CHAPTER I.

INTRODUCTION

Scoliosis or lateral curvature of the spine, although not a common condition, is not an infrequent one. Persons with scoliosis are relatively unknown to the general public, but represent a significant number of the patients treated in any orthopedic clinic. The medical profession has long been interested in their care, and at the present time there is considerable discussion and controversy as to the efficacy of different methods of treatment.

In 1941 the orthopedic clinic of the Massachusetts General Hospital contributed forty-one cases to a nationwide study of the end results of idiopathic scoliosis. The findings of this study were published in the "Journal of Bone and Joint Surgery" for October, 1941. This present study was undertaken at the suggestion of the professional staff of the orthopedic clinic who felt that a follow-up of these patients with emphasis on their social adjustment as well as their present medical condition would be beneficial.

Purpose

The purpose of this study is twofold: (1) from a medical point of view to determine the end results of a long period of treatment; (2) from the point of view of the medical social worker to determine what scoliosis has meant to the patient as a person and how it has affected his every day adjustment.

From a medical point of view this study will consider (1) the treatment the patient has had; (2) the amount of spinal curvature now as compared to the curvature at patient's first examination in clinic; (3) whether the deformity has led to unequal leg lengths, prominent hip, or prominent shoulder; (4) whether the patient has pain; (5) the patient's capacity to carry on normal activities. This information has been obtained from the doctors following physical examination and x-ray.

From a social point of view this study will consider (1) the amount of education the patients obtained — was this affected by their physical condition; (2) the patients' present circumstances — are they married, do they have a family, are they able to care for their home; (3) the occupation of the patients — what sort of work the patients are doing, whether or not they like it, how they happened to obtain that type of work; (4) what activities or sports they take part in; (5) what contact they have had with social service and how they feel that social service has helped them; (6) what the patient himself thinks about the deformity.

Method

A letter was sent to each of the original forty-one patients asking them to take part in a study of scoliosis being undertaken by the hospital. It was explained that this would require one clinic visit when the patient would have a careful physical examination and x-ray and would also talk with the writer who was interested in the social aspects of

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Method

A letter was sent to each of the original forty-one patients asking them to take part in a study of scoliosis being undertaken by the hospital. It was explained that this would require one clinic visit when the patient would have a careful physical examination and x-ray and would also talk with the writer who was interested in the social aspects of

scoliosis. A tentative appointment was suggested and a self-addressed return postal card was enclosed. When the replies were received, arrangements were made with the scoliosis clinic and the x-ray department so that a minimum of patient's time would be spent in waiting.

Writer was able to interview each patient when he came to clinic. Patient was then seen by the doctor and following the physical examination, the clinical end results of his treatment were obtained. After the doctor had measured the amount of curvature as shown by the patient's x-ray, the clinical end results were evaluated.

In response to the letters sent, eighteen patients kept their clinic appointments. Four patients made two clinic appointments but did not keep them. Writer was able to talk with four patients who felt that they were getting along well and were not interested in taking part in the study. One patient was visited at home – she is married, has a baby and felt that it would be too inconvenient to come to clinic. Seven patients had moved away and their letters were returned postmarked "unknown at this address." Eleven patients did not acknowledge receipt of either original or follow-up letter.

Selection of Patients

The individuals used in the study were a group of patients previously selected for a five-year study of the end results of idiopathic scoliosis. Since this study was to be a follow-up of the original one but was to cover a longer period,

the same group of patients were used.

Sources of Data

Medical information has been obtained from the patients' medical records, medical literature, supplemented by conferences with the doctors in the scoliosis clinic of the Massachusetts General Hospital. The medical end results on each patient were first obtained from the doctor and when these had been completed, the medical end results on the patients as a group were evaluated and interpreted by him.

Social information has been obtained from social records, and individual interviews with each of the patients, supplemented by conferences with the medical social worker in the scoliosis clinic.

Measurement of Spinal Curvature

The amount of the spinal curvature was measured on the x-ray in the same manner as in the previous study. The vertebrae on either side of the curve with a parallel interspace were selected as the end or neutral vertebrae. A line was then drawn parallel with the top of the upper end vertebra and one parallel with the bottom of the lower end vertebra and a perpendicular erected to each of these lines. At the intersection of the perpendiculars the angle of deviation from the normal (one hundred and eighty degrees) was measured.

The amount of curvature of each patient was measured by the doctor who had examined the patient at the clinic visit.

Although the general method of measurement is the same

in both studies, there is apt to be some variation in the degree of curvature obtained due to the selection of the neutral vertebrae.

CHAPTER II.

SCOLIOSIS

Definition

"Scoliosis or lateral curvature of the spine is a condition in which a series of vertebrae remain constantly deviated from the normal spinal axis; the lateral deviation is usually accompanied by some degree of rotation of the vertebrae. Scoliosis is a deformity rather than a disease and is most often secondary to pathologic changes outside the spine itself."[1]

Scoliosis is more common in girls than in boys. It is usually first noticed in early adolescence and is present to some degree for the remainder of the person's life. Because it is a deformity it has a particular meaning for the person, especially during adolescence.

Types

Scoliosis may be divided into two main types — functional and structural. Functional scoliosis occurs as a result of postural influences, and is not accompanied by changes in the structure of the spine, and is relatively easy to correct. On the other hand, structural scoliosis is accompanied by definite morphological abnormalities, and it is this type that causes concern. Unarrested cases of functional scoliosis may undergo morphological changes and progress to a structural type.

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1 Albert Rives Shands, Handbook of Orthopaedic Surgery, p. 332.

All of the cases in this study are of the structural type.

Etiology

Functional scoliosis is caused by postural influences.

There are many causes of structural scoliosis. The known causes are: (1) the presence of a hemivertebra in the spinal column: (2) destruction of the muscles supporting the spinal column, caused by infantile paralysis or muscular dystrophy; (4) collapse of the lung and contraction of the thoracic wall in chronic empyema.

Cases in which the causes are unknown are grouped together under the term 'idiopathic', and it is with cases of this nature that this study is concerned.

Presenting Symptom

Scoliosis is a condition which develops gradually and there frequently is no complaint until the deformity is noticed. The parents, an observing relative, or the school may notice that the child's back is crooked, or that he has a high shoulder, prominent hip or protruding shoulder blade. The child is then brought to the doctor and the condition diagnosed. Occasionally the child may have complained about pain, but this does not usually occur until the deformity is well developed. When present, pain may be due to the pressure of the ribs upon the crest of the ilium, or to the crowding of the abdominal organs. Scoliosis may also bring about shortness of breath due to diminished respiratory capacity.

In the group of twenty-three patients the presenting symptom in sixteen cases was a high or prominent shoulder.

TABLE I.

PRESENTING SYMPTOM

Symptom		Patients
Cosmetic		22
	Curvature	6
	High or prominent shoulder	16
	Prominent hip	0
Backache		1
Total		23

Treatment

In general it may be said that the treatment of scoliosis falls into three mutually complimentary stages:[2] (1) exercises for mobilization of contracted structures; (2) Correction of the curvature by application of strengthening forces such as plaster jackets, braces, etc.; (3) maintenance of the correction by providing additional support for the spine namely, by spinal fusion operation.

Exercises

The purpose of exercises is to: (1) mobilize curved portions of the spine; (2) develop greater strength in spinal muscles weakened by the developing deformity; (3) to increase

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2 Ibid., p. 337.

the power of the spinal muscles so that they will be able to support the spine as the deformity increases.

Scoliotic patients are referred by the doctor to the physical therapy department to be taught exercises. It may require several visits before the patient is able to do them adequately without supervision. Because of the importance of exercises in the patient's treatment, regular appointments are made to return to that department, and a check made on patient's progress.

The importance of exercises in this treatment of patients may be seen by the fact that twenty-one out of twenty-three patients were taught exercises. The number of visits made by these patients to the physical therapy department varied from three in the case of an active, athletic girl with a slight curvature, to fifty-two in the case of a quiet, rather sluggish boy with a severe scoliotic condition.

Through exercises patients are also taught how to carry themselves so that their deformity is least noticeable. By means of trunk shifting and rotation, patients learn how to carry the body so that the shoulders are held squarely over the pelvis, and the pelvis squarely over the ankles. The success with which patients learn to do this was shown in this group of patients whose deformity, quite apparent on individual physical examination, seemed to disappear when they were fully clothed and seen among a group of patients.

Braces

The purpose of braces is to support the spinal column and to maintain it in as correct a position as possible. There are many types of braces and corrective jackets used but the one referred to most frequently in this study is the Barr Buschenfeldt type invented by Dr. Joseph Barr, Chief of the Orthopedic Service and Mr. Karl Buschenfeldt, appliance maker, both of whom are affiliated with the Massachusetts General Hospital.

With the exception of the four patients who were treated solely by exercises, all of the patients in this study wore braces. The period of time they were worn varied from eight months to eight years depending upon the severity of the spinal curvature and individual response to treatment.

Operation

When it is apparent that the rapid increase of the spinal curvature cannot be prevented by exercises, braces or any other type of conservative treatment, a stabilizing operation is recommended by the doctor.

The operation itself consists in a bridging of a number of the vertebrae, the number depending upon the details of the curvature. In order to secure the fusion of the vertebrae, an autogenous bone graft usually from the tibia is inserted along the spinous processes. It is not uncommon for the operation to be performed in two stages when there are a number of vertebrae to be fused.

The operation is preceded by a period of hospitalization and bed rest. During this time an attempt is made by means of traction, braces and other manual methods to bring the spine into as straight a position as possible.

In the six cases of spinal fusion operation in this study a risser jacket was worn by the patient during the period of forcible correction. A risser jacket is a body cast of plaster which covers the patient's trunk and also includes one thigh. Although it is a plaster cast, it is made with anterior and posterior hinges and a turnbuckle so that it may be adjusted as the patient's spine is realigned. When it is felt that a maximum amount of correction has been achieved a spinal operation is performed with the patient still within the risser jacket and a window being cut in the cast at the site of the operation. The purpose of not removing the cast before the operation is to prevent the loss of any correction which has been achieved.

Following the operation there is a long period of convalescence. The risser jacket is not removed for a period of from three to six weeks following operation and at that time a lighter cast is substituted. After about three months the patient may be allowed to be ambulatory and he must then wear a strong brace for approximately one year. The purpose of this long period of convalescence is to allow the fused area to

become solid and the new bone to become strong thus preventing any further development of a spinal curvature.[3]

[3] The medical information used in this chapter was obtained from conferences with the doctors in the scoliosis clinic of the Massachusetts General Hospital and also from Albert Rives Shands' "Textbook of Orthopedic Surgery."

CHAPTER III

GENERAL INFORMATION REGARDING PATIENTS IN STUDY

The patients used in this study comprise a group of twenty-three, of whom five are males. Since scoliosis occurs more frequently in girls, it would be expected there would be a smaller number of boys in the group. The present ages of the patients range from twenty-two to twenty-eight.

TABLE II

AGE AND SEX OF PATIENTS, MARCH 1947

Age in Years	Patients		Total
	Male	Female	
22	0	2	2
23	0	3	3
24	4	4	8
25	1	3	4
26	0	4	4
27	0	0	0
28	0	1	1
29	0	1	1
Total	5	18	23

Five of the patients are married, four of whom have one child. Of the eighteen single persons, four are engaged to be married.

TABLE III

MARITAL STATUS AND SEX OF PATIENTS

Marital Status	Patients		Total
	Male	Female	
Single	4	14	18
Married	1	4	5
Total	5	18	23

These patients have been coming to clinic for a period of from fourteen to eight years. In view of the fact that most of the treatment occurred during the first years of follow-up, many of them had not been to clinic for some time previous to receiving the request for this follow-up visit. The fact that so many patients, many of whom were working, were willing to take the time to come in to clinic would seem to indicate both their willingness to coöperate with the hospital, and their own interest in their condition.

TABLE IV

PERIOD OF FOLLOW-UP

Years of Follow-up	Patients
14	1
13	0
12	1
11	1
10	8
9	9
8	3

From Table V, it can be seen that of the twenty-three patients who took part in this study, fourteen had not been in the clinic for the past five years.

TABLE V

TIME ELAPSED SINCE LAST CLINIC VISIT

Number of Years	Patients
1	6
2	2
3	0
4	1
5	14
Total	23

The age at onset of scoliosis in these patients varied from seven to sixteen years, with thirteen to fifteen being the usual age.

TABLE VI

AGE AT ONSET

Age in Years	Patients
7	1
8	1
9	1
10	1
11	3
12	1
13	4
14	8
15	2
16	1
Total	23

The age at beginning of hospital treatment varied from eleven to eighteen years with fourteen being the usual age.

TABLE VII

AGE AT START OF HOSPITAL TREATMENT

Age in Years	Patients
11	1
12	1
13	1
14	9
15	7
16	2
17	1
18	1
Total	23

In the period between onset and the beginning of hospital treatment at the Massachusetts General Hospital: (1) two patients were treated at Children's Hospital until they became overage and went to Massachusetts General Hospital; (2) six patients were treated by local medical doctors who later referred patients to Massachusetts General Hospital; (3) twelve patients were brought to Massachusetts General Hospital by their parents within one to six months; (4) one girl went four years without treatment; (5) two girls went two years without treatment.

CHAPTER IV

PATIENTS TREATED BY EXERCISES

There are four patients in this study who were treated by exercises and have not worn a brace. Their cases are presented.

Sally H., age twenty-two, was fourteen when first seen in clinic. She had been sent home from school with a note saying she had a "crooked" spine, possibly tuberculosis of the spine. Upon examination Sally was found to have a right dorso-lumbar curve of seven degrees with mild rotation. Her condition was observed for three months, and then she was given postural exercises. In 1947 her curvature measures sixteen degrees. Her end result is considered excellent both because of the slight degree of change in curvature and also because of her excellent bodily posture and symmetry.

Sally is a tall, attractive, well-built girl, who stands with excellent posture. Although her curvature is slight and she never has pain, Sally has been very regular about returning to clinic for check-ups. She has also continued to do her exercises because she feels "they are good for her figure."

Sally, who has a pleasant, friendly manner, is a high school graduate and has been employed as a telephone operator for the past four years. Previous to that time she worked in the office of a life insurance company.

This girl has never been particularly concerned about her condition because her clinic check-ups have always been encouraging. She says however that her mother has always considered it "potentially dangerous."

Sally enjoys swimming and dancing and follows photography and developing as a hobby.

Clifford C., now twenty-four, was fifteen when first seen in clinic. He had a right dorsal forty-three degree curve with mild rotation. His treatment consisted of observation followed by posture exercises. In 1947 his end result is considered good, although it is felt that he needs postural exercises. Due to an inadequate x-ray it was not possible to measure the present amount of spinal curvature.

Clifford came regularly to the hospital for check-up until he reached sixteen years of age and went to work. He then found it hard to spend the time required in making a clinic visit and eventually stopped treatment. When he had pain in the region of his back he sought treatment by an osteopath. However, when he received the letter for this study, he replied promptly and was glad to return to clinic.

Clifford is now married and the father of a month-old son. He has taken over and expanded his father's fruit business and takes considerable pride in the success he has achieved.

This patient's chief reason for returning to the clinic was to find out about the condition of his back. He has pain occasionally, and wondered if it might be gradually growing worse. He expressed some concern about the possibility of his son's inheriting the condition, and inquired about the advisability of taking some preventive measures.

Clifford finished the second year of high school and then went to work for his father. Although he sometimes works

a twelve hour day, he enjoys his work because he feels he is "getting ahead." He has little time for recreation, but when he does have free time, devotes it to bowling.

Margaret M., age twenty-eight, was twenty years old when first seen in the clinic. She had a right dorsal sixty-five degree curve with moderately severe rotation. Due to the fact that on admission it was felt her curvature was fixed, Margaret's treatment has consisted of symmetrical posture exercises. In 1947 her end result is good. The amount of her curvature is seventy-five degrees. The amount of increase is within the limits of error in measurement, and her general appearance is considerably improved.

This girl is tall, with a sweet, pretty face. At the time of her clinic visit she was attractively dressed, and her clothing was styled so that her deformity would be least apparent. Margaret describes herself as "unnecessarily self-conscious about it."

Margaret completed the second year of high school, and for the past ten years has worked as a lacer in the packing room of a shoe factory. The work involves her being on her feet all day and when tired, Margaret suffers pain in her back. However, she likes the work and does not feel she would like to make a change.

Rita, now twenty-two, was not interviewed, but in responee to the letter her mother talked with writer. Rita is now happily married and is living in another part of the state. Mother did not forward the letter because she was afraid that her son-in-law might not know that his wife had been treated for scoliosis.

This girl was twelve when she first came to clinic. At that time she had a right dorsal forty-five degree curve with mild rotation. Rita reported regularly for exercises and check-up until two years ago.

Mother says that Rita is in excellent health and never has any pain. Following her graduation from high school she enrolled in a school of physio-therapy, and during the war served as a WAVE in the physio-therapy program. It was while she was in the service that she met and married her husband.

Mother said that she and Rita had always tried to keep Rita's condition a secret, and no one but the immediate family knew about it. Although satisfied with Rita's condition mother wishes that the girl could have been operated on, and had the deformity removed entirely.

Summary

The fact that these patients never wore a brace is significant, both from a medical and a social point of view.

In the study of 1941, it was brought out that in sixty per cent of patients treated with exercises the deformity is increased and in forty per cent it remained unchanged. The number of cases studied here are not sufficient to be conclusive and are of interest only on an individual basis.

From a social point of view, treatment by exercises does not have the emotional significance to the patient that treatment with a brace seems to involve. It can readily be seen what wearing a brace would have meant to Rita and her mother who wanted to keep Rita's condition a secret.

The fact that Margaret M. was twenty years old when she began treatment and by that time had developed deformity makes her adjustment more difficult. Margaret, who is very self-conscious feels that had she been treated earlier, her deformity might have been overcome. It is also possible that Margaret might have developed a better attitude regarding it.

Sally and Clifford, the other two patients in this group, have never looked upon their condition as a serious deformity. Sally, a conscientious type of person, has done her exercises regularly, and her routine check-ups with the doctor have been satisfactory. Clifford, now married, was concerned that his condition which occasionally produces pain might eventually develop into a deformity.

CHAPTER V

PATIENTS TREATED BY EXERCISES AND BRACES

Thirteen patients out of the twenty-three in this study have worn braces. Their cases are presented.

Barbara E., age twenty-seven, was sixteen when first seen in the clinic. She had a right dorso-lumbar thirty degree curve with mild rotation. Her treatment consisted in: 1) postural exercises;2) wearing a taylor back brace for one year. In 1947 the end result of Barbara's treatment is considered good. It is recommended that she have exercises at the physiotherapy department as it is felt that her posture could be greatly improved. Barbara's x-rays were not adequate for measurement.

When Barbara was seen for this study she was an attractive, nicely dressed girl with a very poor posture. She is a high school graduate and has completed one year of evening business school. For the past ten years she has been employed in the office of a local shoe company.

Barbara talked a great deal about her deformity and what it meant to her. She described herself as shy and retiring and stated that in school she was known as "hunch back" or "banana peel." To have to wear a brace the last year of high school was the climax to her self-consciousness. She describes that year as a most unhappy one and a time when she took refuge with books and older people.

Barbara says she still feels shy and self-conscious and has very few friends. She is however very happy about the fact that she has recently become engaged. Her financé is fifteen years her senior and was a friend of one of her relatives.

Barbara has never taken part in sports and lives a very quiet life.

Louise P., now twenty-five, was fifteen when she began medical treatment. She had a right dorsal sixty-five degree curve with moderately severe rotation. Her treatment has been as follows: 1) posture exercises; 2) turnbuckle brace worn for one year; 3) a light corset. In 1947 her end result is considered good. The amount of curvature is sixty-five degrees. She does, however, complain of some back ache.

Louise was well known to social service during the period of active treatment. Her father was dead and her mother extremely upset over the father's death, regarded Louise's deformity as just one more calamity. When any aspect of Louise's treatment was discussed with her, mother would weep copiously. Louise, an only child, unhappy at home, and with no outside friends, early began to show neurotic tendencies. As it was apparent that the family was in need of case work help, they were referred to the Family Society.

When seen in 1947, Louise is an attractive appearing, smartly dressed girl who has little evidence of deformity. She has completed high school and has taken some evening courses. In discussing employment, Louise brings out the fact that she hates work and never holds a job longer than two months. She would like very much to get married but feels that because of her curvature she should never have any children.

She has never taken part in any sports and the only activity she enjoys is dancing.

Sarah M., age twenty-four, was nine when she began treatment at the Children's Hospital. While under treatment there she wore: 1) turnbuckle jacket for two years; 2) straight jacket for four years; 3) castex jacket for two years. When she became sixteen she was transferred to Massachusetts General Hospital and since that time has been wearing a laced corset. In 1941 she had a right dorsal seventy degree curve with mild rotation. In 1947 there is some question of her end result as her x-ray shows a fourteen degree increase in curvature. Sarah also complains of occasional pain.

Sarah is an attractive, intelligent, high-spirited girl with a great deal of drive. She is a high school graduate and is now taking an evening art course. Sarah is employed as a blueprint reading supervisor for a large industrial concern and frequently has to put in over-time. Before obtaining this job she had to pass a physical examination and her curvature was not discovered until the doctor read her chest x-rays.

Sarah is very interested in drama both acting and writing and has taken part in radio broadcasts. She likes to dance but has little time for other sports.

Sarah found the years of wearing a brace difficult because she felt different from the other children. The braces also caused her clothing to wear out before her family could replace it. The fact that her deformity was not noticed in the physical examination at work meant a great deal to Sarah's morale as she still at times feels very self-conscious about it.

Sarah is conscientious both about doing her exercises and in returning to clinic for check-ups and her only fear is that her curvature may grow worse.

Nancy S. now twenty-six began her treatment at the age of eleven at the Children's Hospital. She had a right dorsal fifty-five degree curve with mild rotation. Her treatment consisted in: 1) symmetrical exercises; 2) turnbuckle brace worn for one year; 3) plastic jacket worn for one year. When she became sixteen in 1937 she waw transferred to Massachusetts General Hospital. Her end result in 1947 is considered good. Her x-ray was not satisfactory for measurement. Nancy has pain only on exertion or when she is in an awkward position.

Nancy a college graduate is married and has a two-year old son. She lives a very full life as a housewife caring for her family and home as well as taking part in the social affairs of the community. Interested in active sports, Nancy swims, bowls, sails, and plays tennis.

Nancy describes her deformity as something that does not bother her now but as a matter of great concern to her when she was growing up. She was already conscious of her chubbiness when she had to begin wearing a brace. She describes this as a very difficult period but a time that was helped by the fact that she liked music and was a very fine pianist and organist. Nancy also felt that the fact that she was able to leave off her brace before she finished high school helped her immeasurably. Never able to take part in sports, Nancy then became quite athletic.

Both Nancy and her husband came in to clinic as her husband was anxious to talk with the doctor about Nancy's

condition, the possibility of it getting worse and whether or not it might eventually effect her lungs.

Bernard J. age twenty-four was fourteen when he first came to clinic. He had a right dorsal thirty-five degree curve with moderate rotation. He was treated by: 1) posture and asymmetrical exercises; 2) wearing a turnbuckle brace for a year. In 1947 his end result is good. His curvature measures forty-five degrees, the difference being within the error of measurment. Bernard has no pain.

Bernard is now a tall, well-built, nice looking young man whose curvature would never be apparent to a casual observer. Bernard served in the Army and had some overseas service. For the past year he has been working in a leather factory cutting hides, a rather strenuous job.

Bernard did not feel that his physical condition had anything to do with his present adjustment. He did, however, bring out the fact that if he had not been such a "wise kid" growing up he would be better off today. As an example he brought out the fact that he had been put out of school at the end of the first year of high school. Although this was probably only one of a number of factors during the period of adolescence, this period of difficulty coincides with the period when he was wearing a brace.

Bernard who is quite athletic, plays on local baseball and basketball teams. His only concern about his deformity is that it might grow worse as he gets older.

Dorothy G., age twenty-five, was fourteen when first seen in the clinic. She had a right dorsal fifty degree curve with moderate rotation. Her medical treatment has consisted in postural exercises and the wearing of a turnbuckle brace for one year. In 1947 her end result is considered excellent. Her curvature now measures forty degrees. She has no pain.

Dorothy is an alert, intelligent, vivacious person with a good deal of poise and personality. Her clothing is selected with care and she makes an extremely smart appearance. She is a graduate of high and business school and is employed as a secretary. She has always been fond of sports and likes to ski, swim, bowl and play tennis.

Dorothy found the wearing of a brace difficult because not only was it cumbersome but it meant that she had to give up most of her athletic activities. However she feels the correction achieved has more than compensated her.

Dorothy's only concern now regarding her deformity was the same as with many other girls in the study, namely, would it affect her ability to have a child.

Mary J., now twenty-two, was thirteen when she began medical treatment. She had a left dorsal forty-five degree curve with moderate rotation. Her treatment consisted in: 1) posture exercises; 2) a turnbuckle brace worn for five years; 3) sleeping in a shell at night; 4) wearing a special corset. In 1947 Mary's end result is considered excellent. Although her curvature measures sixty-two degrees she shows no increase within the past six years. Mary has pain when she gets tired and has to have a day off from work each week.

Mary is now employed as a salesgirl in one of the local department stores. She is a tall, nice looking girl who wears rather heavy make-up and presents a rather flapperish appearance. She has excellent posture and her curvature is not noticeable to the casual observer.

Mary is engaged to be married and was anxious to know if her curvature would affect her ability to have a child. Mary says that she has overcome her feelings of inferiority but speaks of her brace wearing years as particularly difficult because you just couldn't help feeling different from the other children.

Mary is very well known to social service because her family had a very low income and payment for all of Mary's treatment had to be specially arranged. Mary's family still have a marginal income but since she has been working she has attempted to meet part of her medical expenses. During the

period of her medical treatment Mary has developed from a frightened little girl of fourteen with a noticeable deformity and ill-fitting clothing into an attractive smartly dressed young lady with a good deal of poise and personality.

Andrew K., now twenty-five, was fifteen when he began medical treatment. He had a right dorsal ninety degree curvature with severe rotation. Andrew was treated by a turnbuckle brace and a head sling for traction at home. His medical condition was further complicated by the fact that he was an epileptic. In 1947 his end result was good, since there has been no apparent change in his condition.

Andrew had not been to clinic for several years prior to receiving the letter regarding present study. He feels very strongly about the fact that he received training both in high school and at an N. Y. A. training project to become a machinist, rather than for a job better suited to his handicap. The possibility of vocational training for him was discussed, but although Andrew would prefer doing light work, he does not feel ready to make a change now.

Andrew has not had any epileptic attacks for several years, but has a speech defect, and is extremely nervous.

Henry H., age twenty-four, was fifteen when he began medical treatment. He had a right dorsal forty-one degree curve with moderate rotation. His treatment consisted of: asymmetrical exercises and the wearing of a turnbuckle brace for one year. In 1947 his end result is considered good: his curvature measures fifty-one degreeswhich is within the limits of error measurement.

Henry, a high school graduate, is at present supported by his father who runs a shoe business. He was discharged from the army two years ago has never worked steadily, and does not have any immediate plans for employment.

Sarah M., now twenty-eight, was sixteen when she began hospital treatment. She had a right dorsal sixty-five degree curve with moderately severe rotation. Her treatment consisted of posture exercises, and the wearing of a turnbuckle brace for three years.

As Sarah was recuperating from an abdominal operation she could not participate in this study.

Florence R., now twenty-four, was fourteen when she began treatment in scoliosis clinic. She had a left dorso-lumber forty-five degree curve with a moderate amount of rotation. Her treatment consisted of corrective shell for sleeping and postural exercises; also a turnbuckle brace. In 1941, because Florence's curvature was increasing, the doctors recommended that the girl have a spinal fusion, but her parents refused to consider it.

Florence did not come in to clinic for this study, as she was busy making preparations to be married the following week. She has had no further trouble with her back and feels that her condition is, if anything, better.

Veronica A., now twenty-five, was eleven when she started hospital treatment. She had a right dorsal fifty-two degree curve with moderate rotation. Her treatment consisted of mobilizing exercises, and a rotation jacket worn for two years. Then follows a two-year lapse in treatment. Treatment is resumed with postural exercises, and the wearing of a corset. In 1941 it was felt that Veronica had a poor end result as both her curvature and deformity had increased. It was not possible for her to come to the hospital for a clinic visit in conjunction with this study.

Veronica was well known to social service during all of her medical care, but social service worked with her particularly when at the age of sixteen with an increasing spinal curvature the girl felt she must go to work to help support her younger sister and her widowed mother. She was referred to the Community Workshops and liked the work so well that she remained for six years.

Veronica is now married and has a one year old baby. The family occupies an attractive four room house. Veronica says that she has always felt very conscious about her deformity but that now, with the security of marriage, it does not concern her particularly.

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concern her particularly.

Summary

This group of patients differ from the first group in that although both groups had a deformity, these patients had to wear a brace as a part of their corrective treatment. In talking with these patients their feelings about this part of their treatment are brought out by such statements as "that was the hardest time I have ever experienced" or "I don't think I could ever do it again."

In considering the factors that made the brace wearing period difficult the following seem to have been of importance: (1) it made them feel "different" from the other children. This is particularly important during the adolescent stage when children are striving so hard to be like the others and when physical appearance means so much to their morale. (2) Most of these children had been living a normally active life and during this period were forced to give up most of the activities they enjoyed. Resulting from this was a feeling of inferiority and a loss of status. Records show that those patients who had a substitute interest or activity were able to accept this period with less difficulty.

Simultaneously with the wearing of a brace seems to be the feeling of anxiety on the part of both patient and parent about his condition. The fact of wearing a brace seems to denote 'seriousness' to the patient. It was therefore frequently at the period of brace wearing that the real feeling of

the patient and his family toward his deformity was expressed.

A good many of the patients were wearing braces during the depression period. In a family where the income is limited, it is not easy to accept having to spend a part of that income on medical care. This was particularly brought out in the case of Louise and Barbara where the child was already feeling insecure due to other causes,- death of one parent, competition with the other children, etc.

One of the positive factors in this group seemed to be the time when they were able to stop wearing their brace. It seemed to mean a great deal to the patients if they were able to do this while they were in high school. One girl who had been taunted all of her school life about being a "hunch back" found it particularly hard to wear a brace during the last year of high school.

In summing up the present adjustment of these patients there seems to be a stronger awareness about their deformity than was seen in the first group. This awareness, however, does not seem to result in a feeling of inferiority but rather to be based upon the recognition and acceptance of a deformity with an effort to make it least apparent.

CHAPTER VI

PATIENTS TREATED BY FUSION

Introduction

The recognition of the seriousness of a spinal fusion operation from a social as well as a medical point of view may be seen from the fact that all patients who were to undergo this type of operation were referred to social service by the doctor before hospital admission.

The purpose of the referral was to help the patient and his family with their many fears and feelings as well as to make constructive plans for the long period of convalescence which this operation involves. In addition to the many problems that any hospitalization and operation brings, there are problems unique with the spinal fusion itself.

There is the period of forcible correction when the patient is first admitted to the hospital. At this time an attempt is made by means of a risser jacket to realign the position of the child's spine. This is a vigorous type of treatment and one that is carried out with some discomfort to the patient since in an attempt to straighten the curvature, the spine is gradually being bent in the opposite direction. It is essential that the patient and his family not only understand this part of the treatment but also that they are able to accept it.

At least one prominent orthopedist has opposed this

forcible correction, feeling that the medical gain was counterbalanced by the emotional disturbance to the child resulting from extreme discomfort and lack of normal activities. During the past nine months patients at the Massachusetts General Hospital have been allowed to be ambulatory on the ward during this period. Although they present a picture of an extreme in body balance the patients themselves seem to be much more contented than when they were lying in bed.

The operation itself brings out all the fears and feelings about surgery and anasthesia and it is at this point that the patients need explanation, reassurance and interpretation.

In the period following operation there is a long period of convalescence during which the patient is virtually helpless and needs tedious nursing care. This is one of the most difficult times because the patient feels physically well and has become tired of bed rest.

Presentation of Cases

Frances M., now twenty-three years old, was twelve when she first came to clinic. She had a right dorsal seventy-five degree curve with a moderately severe amount of rotation. She was treated by conservative measures (posture training, mobilizing exercises, turnbuckle brace) for a period of sixteen months during which time her deformity progressed considerably. On November 12, 1937, following a month's correction in a risser jacket, Mary had a McKenzie Forbes type of fusion, with a tibial

osteoperiostial graft. Following operation she wore a corrective plaster jacket for three months, a back brace for one and a half years, and following this, a special type corset. In 1947 her end result is considered satisfactory. Frances does not have pain.

Frances, a pretty Italian girl, is one of a large family. Although father has always been employed his wages have been small, and the family has had to plan very carefully in order to manage. Frances' medical care has been expensive and social service has used a number of resources in an effort to help with its cost.

Frances' mother, a large woman who speaks broken English, has had implicit faith in the hospital and has been coöperative in trying to carry out treatment recommended. Because of the language handicap social service has had to interpret a good many aspects of the treatment for her. The seriousness of Frances' condition was at times overwhelming to mother who needed and accepted the support social service was able to give. When Frances was ready to be discharged from the hospital following her operation, mother realized that due to crowded conditions in the home she would be unable to give the girl the care she needed, and was pleased when three months convalescent care could be arranged through the Children's Mission.

Frances was a bright, friendly child who enjoyed her hospitalization and the opportunity it gave her to meet so

many people. She had such positive feelings about the whole experience that she was very helpful to another child who was frightened and overwhelmed at the thought of having the same operation.

A high school graduate, Frances is now employed in an office. She likes her job and has taken evening courses in order to advance herself. She is very fond of music, has a good singing voice, and takes part in the musical activities at the local settlement house.

Frances states that she found brace wearing the most difficult part of her treatment. Not only did the brace make her feel awkward, but it wore out her clothing that was difficult to replace. Although Frances' deformity is apparent, she does not seem to be self-conscious about it and feels that she is so much better off than some of the other people she has met at clinic.

Grace A, now twenty-five, was fifteen when referred to the clinic. She had a right dorsal fifty-seven degree curve with a moderately severe rotation. On November 6, 1937, she had a McKenzie Forbes type of fusion with tibial osteoperiostial graft. She wore a corrective cast for three months post-operatively and a turnbuckle brace for one year. Her end result in 1947 is considered excellent. Her fusion is solid and she has been able to maintain the correction achieved. She does not have pain.

Grace, the oldest in a family of six children was referred to social service for help in obtaining medical treatment. Her parents were of Polish extraction and the family lived in another part of the state. Grace's mother, a quiet, conscientious person was anxious that Grace have medical treatment but at the same time was confronted by the fact that the family lacked funds even for transportation to clinic. Grace's father worked steadily but his pay was so small that it required skillful managing on the mother's part to meet even routine expenses. In helping this family to obtain adequate medical care for Grace which eventually involved a spinal fusion operation the resources of both private and public agencies in family's community were used.

Although the income of the family was small, both parents were intelligent and cooperative and used considerable ingenuity in working out the details of her long period of post-operative care at home.

Grace was a very shy and retiring type of child who was apt to be discouraged by her physical condition and was helped through her period of hospitalization both by social service and by association with Frances an active enthusiastic girl who was undergoing the same type of operation.

At the time of her hospitalization Grace had decided not to return to high school. However with the assistance of a home teacher, Grace was able to keep up with her class and eventually graduated from high school.

For the past seven years Grace has been working as a bench worker in a large factory. Although she finds the work monotonous she remains there because of the attractive salary.

Grace has never been especially interested in sports but enjoys dancing and goes bowling with a group from her place of employment.

Although Grace describes herself as "much less self-conscious than she used to be" she still wonders how many people notice her deformity. She finds it hard to buy clothing and becomes discouraged becuase she always has to buy the same type.

Sylvia, now twenty-three, was fifteen when she first came to the clinic, She had a left dorsal one hundred degree curve with some rotation. In December 1938 she had a spinal fusion which due to the number of vertebrae involved had to be performed in two stages. In 1947 her end result is considered good. She does not have back pain.

Sylvia lived in a small town in the western part of the state. Her family had very limited resources and all of her medical treatment was arranged through the local department of public welfare.

Sylvia was a quiet, meek girl of fifteen whose deformity made her appear a "hunch back." She was retarded in school and at the time of her hospitalization was in the fifth grade. Sylvia became very well known to social service because in addition to her many fears about the operation this was her first time away from home and with the distance involved her parents could not visit her often. Although frightened and upset at first by the hospital routine, Sylvia gradually became adjusted to it and before discharge seemed to be enjoying her stay. With the coöperation of the Visiting Nurses' Association, it was possible to arrange for Sylvia's convalescent care at her own home.

Sylvia is now married and has a three-year old daughter. Due to the housing shortage, she and her husband, a veteran, are living with her mother. Meanwhile Sylvia works everyday in the mill with her husband in order to obtain additional money to

furnish their home.

Sylvia still has a noticeable deformity. She is quite sensitive about it particularly because she feels that if she had obtained medical care at an earlier age, it might have been avoided. She does however take considerable pride in the fact that she now has a"healthy and attractive" daughter.

Louise A., now twenty-three, was fourteen when she first came to the clinic. She had a right dorsal forty-five degree curve with moderate rotation. She was treated by: (1) asymmetrical exercise; (2) turnbuckle brace. In view of the fact that in one year her curvature increased ten degrees, a fusion was recommended. On November 10, 1939, Louise had a McKenzie Forbes type fusion with tibial osteoperiostial graft. Postoperatively she wore a plaster jacket and a back brace for five months.

In 1947 Louise's end result is considered satisfactory. Her recent x-ray shows a slight increase in curvature but the increase is within range of possible error in measurement. She suffers no back pain.

As was the case with the other patients in the group, social service worked closely with Louise's parents in arranging her hospitalization and after care. The family income was very limited, but the parents were intelligent and coöperative and the situation was excellent. In this case it was not necessary to work with any outside agencies.

Louise was an exceptionally attractive child with a pleasant thoughtful manner, and got along well on the ward. Her mother had very thoughtfully and carefully prepared her for the operation and Louise was very plucky and cheery about it.

Louise is a high school graduate and has been employed for the past six years as a bookkeeper. She is an alert, attractive looking girl with a great deal of poise and a pleasant, friendly outgoing manner. She is very active in sports; likes

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to swim, ski, toboggan, and play tennis. Although she still has considerable deformity, it is not apparent due to her excellent posture and good judgment in selecting clothing.

Louise is engaged to be married and was very anxious to talk with the doctor about her ability to have children. Her fiancé's brother, a physician, had raised this question and Louise was quite concerned about it.

In discussing her deformity Louise said that at first it did bother her but she has since learned that if she wore proper clothing and had good posture it was not obvious. She felt that her most difficult time was when she was wearing the brace and "just could not do anything about it."

Robert A., now twenty-four, was fourteen when he first came to the clinic. He had a fifty-seven degree dorsal curve with a moderately severe rotation. He was treated by mobilizing exercises, and a turnbuckle brace which he wore for two years. As his curvature increased considerably, on March 6, 1942 he had a spinal fusion. In 1947 it is felt that there is a good end result on his treatment. He has occasional chest pain.

Robert, a pale, thin, slight boy was nineteen when he had his spinal fusion and was able to understand its significance. He was an exceptionally coöperative patient with a mild easy manner but at the same time had a good deal of courage and determination.

Robert was the youngest in a large enterprising Italian family of high standards. Although he was the center of the family's concern and had always received a good deal of consideration, he was beginning to become dissatisfied because he was the only member of the family who had not been able to obtain a good position.

Following Robert's convalescence, he was referred to the Department of Vocational Rehabilitation and under their sponsorship was able to take a business course. For the past three years he has been employed as a bookkeeping clerk in a newspaper office and is most enthusiastic about his job.

Robert has never been active in athletics but enjoys rollerskating and dancing.

Patricia W., now twenty-three, was fourteen when she began hospital treatment. She had a right dorsal forty-five degree curve with moderate rotation. She was treated by: (1) exercises for one year; 2) hyperextension cast for two months; 3) back brace for eight months. Because her curvature was increasing it was felt advisable for Patricia to have a spinal fusion. On August 12, 1938, following a period of correction in a Minerva jacket with head traction, she had a McKenzie Forbes type of spinal fusion operation. Her subsequent treatment consisted of: 1) corrective jacket worn for three months; 2) body jacket worn for two months; 3) back brace worn for nine months. In 1947 the end result of her treatment is considered good. Patricia has a fifty degree curve. She suffers back pain when overtired.

At the time of hospitalization Patricia was a small, apparently undernourished child, the youngest in a family of four children. Both of her parents were college graduates. Her father was partially crippled as a result of a recent attack of poliomyelitis. At the time of patient's treatment her brother had just gone out west with the plan of working his way through college and possibly medical school.

Patricia is now a graduate nurse employed in another hospital. Her brother has completed his education and is a practising physician. A sister is also a graduate nurse.

In discussing her condition Patricia brought out the fact that she had had the condition for so long it has become

a part of her. For a long time she had wondered why that condition had to happen to her, but as she has grown older she has come to accept it and to realize she could be a whole lot worse.

Summary

It is interesting that in talking with this group of patients who had a spinal fusion several years ago, in no case was the operation or treatment brought out as being particularly difficult. As was the case with the previous group, these patients talked about their brace wearing as the hardest time. One of the patients brought out the fact that it was easier to wear her brace after her operation because the other children knew she had been operated upon and accepted it as a part of her treatment.

It is felt that a significant factor in the way these patients were able to accept their hospitalization and treatment was that in all cases they came from a stable home situation. Although in four cases the family income was extremely limited, the parents were emotionally mature and were able to help the child through this period. It is interesting that even the child of limited intelligence was able to go through this type of treatment and her only feeling about it now is a regret that it was not done at an earlier age.

The personality of the patients seems to have been another factor of importance in their adjustment. Although there was a wide variance in personality types and some patients needed more reassurance than others, none of the patients seemed to have any emotional feelings regarding their deformity and were able to accept their treatment as a step in overcoming it.

Summary

At the present time all of these patients are living normal active lives and are in no way handicapped by their deformity. Their curvature is apt to be more pronounced than those in the other groups due to the fact that it was a more serious condition. However in this group as in the other two previously discussed, one sees the same acceptance of their curvature without it seeming to interfere with their everyday adjustment.

CHAPTER VII

CONCLUSIONS

The results of this study of the present medical social status of a group of patients who have received treatment at the scoliosis clinic of the Massachusetts General Hospital have been positive and reassuring.

From a medical point of view the clinical end results of treatment indicate satisfactory results in two cases, good results in eleven cases and excellent results in five cases. Based upon the type of treatment the end results were: (1) in three patients treated by exercises one end result excellent, two end results good; (2) in nine patients treated by exercises and braces, two end results excellent, seven end results good; (3) in six patients treated by spinal fusions, two end results satisfactory, three end results good, and one end result excellent.

On the other hand a study of the x-rays bring out slightly different findings. The amount of spinal curvature now as compared with when the patient started treatment is as follows: In patients treated by exercises only there is only a slight difference in the degree of curvature now as compared with when they began treatment. This may be explained by the fact that in two cases the curvature was slight and not likely to increase markedly and in the third case the amount of curvature was probably fixed when the patient at the age of twenty began treatment. In patients who have been treated by braces

and exercises in fifty per cent of the cases there is a definite increase in the amount of curvature now as compared with when the patient began treatment. The other fifty per cent show a change of less than ten degrees which is within the limits of error in measurement. There does not appear to be any relationship between the increase in the curvature and either the length of time the brace was worn or the original degree of curvature. In patients treated by spinal fusions one-third have maintained the amount of correction achieved prior to operation, one-third show some loss of correction and one-third show a notable loss of correction.

The seeming disparity between the clinical end results and the study of the x-rays is due to the fact that the clinical end result is based upon the patient's present physical condition and is determined not only by the amount of curvature but also by the amount of bodily compensation and adaptation the patient has developed to his deformity. Thus although a patient may have a large degree of spinal curvature if he is able to carry his body so that his shoulders are even and he stands without a list, his end result would be considered better than another person who had a smaller amount of curvature but who had very poor posture. High shoulders, prominent hips and unequal leg lengths are all considered in deciding the clinical end result.

Eight of the patients complained of back pain. However it was occasional, frequently occurring with fatigue or over-exertion and may or may not have been due to their scoliosis.

All of the patients are able to carry on normal activities and none have been handicapped by their physical condition.

From a social point of view all of the patients are living normal useful lives. Five of the patients are married, four having one child each. Four other patients are engaged to be married. A number of the patients raised the question of their ability to have a child and were very much relieved by the doctor's reassurances on this matter. An indication of the interest of the doctors in these patients is shown by the fact that it was suggested to these patients that they might return to clinic during pregnancy for consultation regarding their scoliosis and the type of support they might wear.

Marriage and the security it affords seems to mean a great deal to these patients. Patients who were married stated that since that time they had thought less about their deformity.

The present occupations of the group are numerous; nursing, physical therapy, bookkeeping, and office work, clerk in a department store, telephone operator and general factory work. Their occupations vary and do not seem to follow any definite pattern except for a slight preference for office work. With the exception of two women who are married, there are only two patients who are not regularly employed. One strong and healthy appearing man, a veteran, has been receiving his social

security and has no immediate desire to obtain a job. The other person, a young attractive appearing girl frankly stated that she hated work and never remained on a job more than two months. This girl during the course of her treatment had previously shown the affects of a very unstable home situation.

There is a varied degree in the amount of education these patients obtained. One person, mentally retarded attended school only to the fifth grade. The majority of patients completed high school and some went on for further training. Only in the cases of patients with spinal fusions was school attendance prevented by their treatment. In these cases the patients had visiting teachers during their convalescence. One patient following treatment was referred to the Division of Vocational Rehabilitation and under the sponsorship of that agency then attended a business school. One patient a high school graduate with additional N. Y. A. machine shop training feels very keenly about the fact that his training has prepared him for manual labor rather than for office work which he feels he would be physically better able to do. It is significant that this boy had stopped treatment during the period he was taking vocational training.

An interesting point brought out in this study is the amount of participation of the group in active sports. With the exception of five persons everyone expressed a definite interest in athletics and many persons participate in three or more activities. In view of the fact that in their teens most

of these persons had to interest themselves in other types of recreation, it is significant that in their twenties, they derive satisfaction from participation in athletics.

The amount of contact of these patients with social service varied. All of the patients, however, brought out the fact of how much it has meant to them and to their parents to be able to discuss their fears and misapprehensions about their condition.

From the point of view of the patients present adjustment their deformity does not seem to have had a detrimental effect. Since it is a deformity all patients are aware of it. However, in their many years of treatment with emphasis not only upon correction of their scoliotic condition but also upon improvement of their appearance as related to their deformity, there has developed in these patients a feeling of security and satisfaction as contrasted with their intense feeling of "being different" when they were first seen in clinic.

Approved

Richard K. Conant

Richard K. Conant, Dean

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Massachusetts General Hospital

Boston

NATHANIEL W. FAXON, M.D.
DIRECTOR

SOCIAL SERVICE DEPARTMENT
JOSEPHINE C. BARBOUR, CHIEF

January 3, 1947

Miss Mary Doe
9 Main St.
Blanktown, Mass.

Dear Miss Doe:

Would you be willing to cooperate with us in a study the Hospital is making of patients who have been under treatment in our Scoliosis Clinic? It will require that you make one visit to the Clinic when you will be given a careful examination including x-ray.

Through this study we hope to obtain information that will be helpful to you and to other patients who have a similar condition. We are interested to know how you are and what you are doing. Possibly there is something you would like to talk with us about.

If you are willing to take part in the study would it be possible for you to come to Scoliosis Clinic on Friday, January 17 at 9 o'clock. Will you please check on the enclosed card if you can keep this appointment? If this date is not convenient, would you please indicate another Friday in January or February that would be convenient for you.

We hope you will be able to come in. We shall look forward to seeing and hearing from you.

Very truly yours,

(Mrs.) Hazel Thorpe Fritz
Social Worker,
Orthopedic Service

Enc.
ET:ESM

Massachusetts General Hospital

Boston

NATHANIEL W. FAXON, M.D.
DIRECTOR

SOCIAL SERVICE DEPARTMENT
JOSEPHINE C. HARBOUR, CHIEF

January 8, 1947

Miss Mary Doe
9 Main St.
Blankton, Mass.

Dear Miss Doe:

Would you be willing to cooperate with us in a study the Hospital is making of patients who have been under treatment in our Scoliosis Clinic? It will require that you make one visit to the Clinic when you will be given a careful examination including x-ray.

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We hope you will be able to come in. We shall look forward to seeing and hearing from you.

Very truly yours,

(Mrs.) Hazel Thorpe Potts
Social Worker,
Orthopedic Service

Enc.

ET:KSM

THIS SIDE OF CARD IS FOR ADDRESS

Mrs. Hazel T. Fritz
Orthopedic Clinic
Mass. Gen'l Hospital
Boston, Mass.

Please check one:

( ) I will be able to come to Clinic on Friday, Jan. 17, 1947

( ) I will not be able to keep my Clinic appointment but can come to Clinic on

_____ _____
(day) (date)

Name: _____

END RESULT 1947

1. Survey Number 2. History Number

3. Period of follow-up

4. Date

5. Age at last visit

6. Time elapsed end of treatment till end result.

7. Curve in degrees at end result
   Standing

   Supine

8. Curve at completion of correction

9. Amount of loss of correction

10. List Right Left

11. High shoulder Right Left

12. Prominent hip Right Left

13. Height Standing Sitting Kneeling

14. Leg length R.A. L.A.

15. Vital capacity

16. Appearance of postural curves
    a. Before treatment b. In 1947

    1. Flat 1. Flat

    2. Normal 2. Normal

    3. Increased 3. Increased

17. Patient's statement as to:
    a. Cosmetic result

    b. Presence or absence of pain

    c. Activities as compared to normal

18. Examining physician's estimate of end result

19. Patient's general development in 1947

Name: Birthdate: Referred to Clinic

Date of spinal fusion

Date of discharge from Clinic

A. Present status

Married

Date of marriage

Age and sex of children

Able to care for home

Single

Living arrangements

B. Education

Grade last attended

Did handicap affect amount of schooling obtained

C. Work record

Present job

Type of work

When obtained

Any special training for it

How obtained

Mode of transportation

Time lost from work due to handicap

Is patient satisfied with job

Previous jobs

Type of work

When obtained

Any special training for it

How obtained

Mode of transportation

Time lost from work due to handicap

Is patient satisfied with job

Why left job

Limitation as to type of work patient can do.

D. Present interests, hobbies, leisure time activities

E. Contacts with other social agencies within last five years

F. How does patient feel that social service has helped him?

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